

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
struct Node {  
    int data;  
    struct Node* next;  
};
```

```
typedef struct Node Node;
```

```
int compare(const void* a, const void* b) {  
    return (*(int*)a - *(int*)b);  
}
```

```
void append(Node** head, int data) {  
    Node* new_node = (Node*)malloc(sizeof(Node));  
    new_node->data = data;  
    new_node->next = NULL;
```

```
    if (*head == NULL) {  
        *head = new_node;  
        return;  
    }
```

```
    Node* last_node = *head;  
    while (last_node->next != NULL) {  
        last_node = last_node->next;  
    }
```

```
    last_node->next = new_node;
}
```

```
void display(Node* head) {
    Node* current = head;
    while (current != NULL) {
        printf("%d -> ", current->data);
        current = current->next;
    }
    printf("NULL\n");
}
```

```
void sort_list(Node** head) {
    if (*head == NULL || (*head)->next == NULL) {
        return;
    }
```

```
    Node* current = *head;
    int values[100], count = 0;
```

```
    while (current != NULL) {
        values[count++] = current->data;
        current = current->next;
    }
```

```
    qsort(values, count, sizeof(int), compare);
```

```
    current = *head;
    for (int i = 0; i < count; i++) {
```

```
    current->data = values[i];  
    current = current->next;  
}  
}
```

```
void reverse_list(Node** head) {  
    Node* prev = NULL;  
    Node* current = *head;  
    Node* next_node;  
  
    while (current != NULL) {  
        next_node = current->next;  
        current->next = prev;  
        prev = current;  
        current = next_node;  
    }  
  
    *head = prev;  
}
```

```
void concatenate(Node** head1, Node* head2) {  
    if (*head1 == NULL) {  
        *head1 = head2;  
    } else {  
        Node* current = *head1;  
        while (current->next != NULL) {  
            current = current->next;  
        }  
        current->next = head2;  
    }
```

```
    }  
}
```

```
int main() {  
    Node* list1 = NULL;  
    Node* list2 = NULL;  
  
    // Append elements to list1  
    append(&list1, 3);  
    append(&list1, 1);  
    append(&list1, 4);  
  
    // Append elements to list2  
    append(&list2, 2);  
    append(&list2, 5);  
    append(&list2, 6);  
  
    // Display original lists  
    printf("Original List 1:\n");  
    display(list1);  
  
    printf("\nOriginal List 2:\n");  
    display(list2);  
  
    // Sort and display  
    sort_list(&list1);  
    printf("\nSorted List 1:\n");  
    display(list1);  
}
```

```

// Reverse and display

reverse_list(&list1);

printf("\nReversed List 1:\n");

display(list1);


// Concatenate and display

concatenate(&list1, list2);

printf("\nConcatenated Lists:\n");

display(list1);


return 0;
}

```

```

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  SEARCH ERROR  COMMENTS
Loaded 'C:\WINDOWS\System64\kernel32.dll'. Symbols loaded.
Loaded 'C:\WINDOWS\System64\KernelBase.dll'. Symbols loaded.
Loaded 'C:\WINDOWS\System64\apphelp.dll'. Symbols loaded.
Loaded 'C:\WINDOWS\System64\msvcrt.dll'. Symbols loaded.
Original List 1:
3 -> 1 -> 4 -> NULL
Original List 2:
2 -> 5 -> 6 -> NULL
Sorted List 1:
1 -> 3 -> 4 -> NULL
Reversed List 1:
4 -> 3 -> 1 -> NULL
Concatenated Lists:
4 -> 3 -> 1 -> 2 -> 5 -> 6 -> NULL
The program 'C:\Users\sohan\Desktop\DS\SinglyLinkedList.exe' has exited with code 0 (0x00000000).

```